

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S7	1	("6754099").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/05/31 14:21
S9	181	S8 and @pd>"20041228"	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 09:20
S8	1388	((257/422) or (365/158)).CCLS.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2005/06/01 09:20
S5	1170	((257/422) or (365/158)).CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 09:20
S2	10	((("5398030") or ("5768181") or ("5946228") or ("6072718") or ("6104633") or ("6242770") or ("6269040") or ("6385082") or ("6388917") or ("6404674")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 09:32
S10	1	"6791856"	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 09:33
S11	16	("5496759" "5748519" "5841611" "5861328" "5892708" "5917749" "6005798" "6005800" "6104633" "6111782" "6134139" "6236590" "6368878" "6424561" "6424564" "6522574").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 10:00
S13	132	(magnetic adj tunnel adj junction) same mram same reference	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 10:01
S14	131	(magnetic adj tunnel adj junction) and mram and (reference adj cell)	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 10:02
S12	1083	(magnetic adj tunnel adj junction) and mram and reference	US-PGPUB; USPAT; USOCR	OR	OFF	2005/06/01 10:02

Search: magnetic tunnel junction AND mram

Search: magnetic tunnel junction AND mram AND reference



Display from INSPEC

ANSWER 5

Title

Fully integrated 64 Kb **MRAM** with novel **reference** cell scheme.

Author

Jeong, H.S.; Jeong, G.T.; Koh, G.H. (Adv. Technol. Dev., Samsung Electron. Co. Ltd., Kyunggi-Do, South Korea); Song, I.H.; Park, W.J.; Kim, T.W.; Jeong, S.J.; Hwang, Y.N.; Ahn, S.J.; Kim, H.J.; Hong, J.S.; Jeong, W.C.; Lee, S.H.; Park, J.H.; Cho, W.Y.; Kim, J.S.; Song, S.H.; Kim, H.J.; Park, S.O.; Jeong, U.I.; Kim, K.

Publication Source

International Electron Devices Meeting. Technical Digest (Cat. No.02CH37358)
Piscataway, NJ, USA: IEEE, 2002. p.551-4 of 957 pp. 4 refs.
Conference: San Francisco, CA, USA, 8-11 Dec 2002
Sponsor(s): Electron. Devices Soc. IEEE
Price: CCCC 0-7803-7462-2/02/\$17.00
ISBN: 0-7803-7462-2

Document Type

Conference Article

Treatment Code

New Development; Practical; Experimental

Country of Publication

United States

Language

English

Abstract

We have fully integrated a 64 Kb **MRAM** with 0.24 μm -CMOS technology. A new sensing scheme employing a separated half-current source is adopted for the **reference** bit line to increase the sensing signal. To reduce cell resistance, a Co salicidation process is applied to transistor formation. In key fabrication processes, the roughness of the buffer layer, on which the MTJs are stacked, is reduced by using Ru on the TiN bottom electrode, and magnetic disturbance is avoided by depositing TiN hard masks on the MTJ under low-power and low-temperature conditions. The tunneling barrier micro-bridge due to the attachment of

by-products during etching is completely eliminated by adopting a 2-step MTJ etch with an introduced capping oxide layer. Consequently, MR values of >30% are found in more than 90% of chips.

Classification Code

B1265D Memory circuits; B2570D CMOS integrated circuits; B3120J Magneto-acoustic, magnetoresistive, magnetostrictive and magnetostatic wave devices; B2550F Metallisation and interconnection technology; B2550E Surface treatment (semiconductor technology)

Controlled Indexing

CMOS MEMORY CIRCUITS; INTEGRATED CIRCUIT METALLISATION; MAGNETIC STORAGE; MAGNETIC TUNNELLING; MAGNETOELECTRONICS; RANDOM-ACCESS STORAGE; SPUTTER ETCHING; SURFACE TOPOGRAPHY

Element Terms

Co; Ru; N*Ti; TiN; Ti cp; cp; N cp; Co*Si; Co sy 2; sy 2; Si sy 2; CoSi2; Co cp; Si cp; N*Ru*Ti; N sy 3; sy 3; Ru sy 3; Ti sy 3; Ru-TiN; CoSi; Si; Ti

Supplementary Indexing

CMOS fully integrated 64 Kb MRAM; reference cell scheme; magnetic tunnel junctions; 0.24 μ m-CMOS technology; sensing scheme; separated half-current source; reference bit line; cell resistance; Co salicidation process; transistor formation; buffer layer roughness; TiN bottom electrode; magnetic disturbance avoidance; TiN hard mask; low-power low-temperature conditions; tunneling barrier micro-bridge elimination; two-step etch; capping oxide layer; 64 Kbit; 0.24 micron; CoSi2; Ru-TiN

Chemical Indexing

CoSi2 int, Si2 int, Co int, Si int, CoSi2 bin, Si2 bin, Co bin, Si bin; Ru-TiN int, TiN int, Ru int, Ti int, N int, TiN bin, Ti bin, N bin, Ru el

Physical Properties

storage capacity 6.6E+04 bit; size 2.4E-07 m

Accession Number

2003:7509347 INSPEC

ANSWER 6

Title

Developments in RAMs (random access memories): FeRAMs and MRAMs: part 2.

Author

Sikora, A.

Publication Source

Elektronik (19 March 2002) vol.51, no.6, p.52-7. 16 refs.
Published by: WEKA-Fachzeitschriften
CODEN: EKRKAR ISSN: 0013-5658
SICI: 0013-5658(20020319)51:6L:52:DRRA;1-H

Document Type

Journal

Treatment Code

Application; General Review; Practical

Country of Publication

Germany, Federal Republic of

Language

German

Abstract

For pt. see *ibid.*, no. 5, p. 66 (2002). Discusses **magnetic RAMs**, Ovonics Unified Memory and polymer-based ferroelectric random access memories. Illustrates the original Rajchman ferromagnetic ring core memory, and presents a diagram of a hybrid **MRAM** cell. Also shows a "**magnetic tunnel junction**" (MTJ) memory, which operates by filtering electron spin polarisation, and explains its operation. A giant magnetoresistive effect (GMR) memory cell is shown, which employs ferromagnetic film layers separated by conducting layers. **Reference** is made to pseudo-spin valve (PSV) technology, also based on the magneto-resistive effect. Examines commercial prospects for **magnetic tunnel junction** memories. Diagrams of a molecular ferro-electric polymer RAM and a polymer-based FeRAM memory (polymers between metal tracks) are presented.

Classification Code

B1265D Memory circuits; B2860F Ferroelectric devices; B3120N Magnetic thin film devices; B3120J Magneto-acoustic, magnetoresistive, magnetostrictive and magnetostatic wave devices

Controlled Indexing

FERROELECTRIC STORAGE; MAGNETIC FILM STORES; MAGNETORESISTIVE DEVICES; RANDOM-ACCESS STORAGE

Supplementary Indexing

RAMs; FeRAMs; **MRAMs**; magnetic RAMs; Ovonics Unified Memory; polymer-based ferro-electric memories; Rajchman ferromagnetic ring core memory; hybrid cell; **magnetic tunnel junction**; electron spin polarisation; GMR; ferromagnetic film layers; conducting layers; pseudo-spin valve technology; magneto-resistive effect

Accession Number

2002:7263848 INSPEC

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Title in English

A High-Speed 128-kb **MRAM** Core for Future Universal Memory Applications

Author

DEBROSSE J.; GOGL D.; BETTE A.; HOENIGSCHMID H.; ROBERTAZZI R.; ARNDT C.; BRAUN D.; CASAROTTO D.; HAVRELUK R.; LAMMERS S.; OBERMAIER W.; REOHR W. R.; VIEHMANN H.; GALLAGHER W. J.; MULLER G.

Organization

IBM Microelectronics, Essex Junction, VT 05452, United States

Publication Source



IEEE Journal of Solid-State Circuits, (2004), 39(4), 678–683, 4 refs.
ISSN: 0018–9200 CODEN: IJSCBC

Document Type

Journal

Bibliographic Level

Analytic

Country of Publication

United States

Language

English

Abstract

A 128-kb **magnetic** random access memory (**MRAM**) test chip has been fabricated utilizing, for the first time, a 0.18- μm VDD = 1–8 V logic process technology with Cu metallization. The presented design uses a 1.4- μm^2 one-transistor/one-**magnetic tunnel junction** (1T1MTJ) cell and features a symmetrical high-speed sensing architecture using complementary **reference** cells and configurable load devices. Extrapolations from test chip measurements and circuit assessments predict a 5-ns random array read access time and random write operations with <5-ns write pulse width.

Availability

INIST–222 L

Accession Number

2004–0198708 PASCAL

Classification Code

001D03I02; Applied sciences; Electronics; Information storage, Information reproduction
001D03F; Applied sciences; Electronics; Microelectronics, Solid state devices
001B30; Physics; Atomic physics, Molecular physics
001D05I01; Applied sciences; Electrical engineering; Electrical power engineering
001D05A; Applied sciences; Electrical engineering
001D11C06D; Applied sciences; Metals, Metallurgy, Materials science; Metallic material transformation
240; Metals, Metallurgy, Materials science

Classification Code (French)

001D03I02; Sciences appliquees; Electronique; Stockage de l'information, Lecture de l'information
001D03F; Sciences appliquees; Electronique; Microelectronique, Dispositifs a l'etat solide
001B30; Physique; Physique atomique, Physique moleculaire
001D05I01; Sciences appliquees; Electrotechnique; Electroenergetique
001D05A; Sciences appliquees; Electrotechnique
001D11C06D; Sciences appliquees; Metaux, Metallurgie, Science des materiaux; Transformation de
materiaux metalliques
240; Metaux, Metallurgie, Science des materiaux

Classification Code (Spanish)

001D03I02; Ciencias aplicadas; Electronica; Almacenamiento de la informacion, Lectura de la informacion
001D03F; Ciencias aplicadas; Electronica; Microelectronica, Dispositivos en el estado solido
001B30; Fisica; Fisica atomica, Fisica molecular
001D05I01; Ciencias aplicadas; Electrotecnica; Electroenergetica

001D05A; Ciencias aplicadas; Electrotecnica

001D11C06D; Ciencias aplicadas; Metales, Metalurgia, Ciencia de los materiales; Transformacion de materiales metalicos

240; Metales, Metalurgia, Ciencia de los materiales

Controlled Indexing

Access time; **Reference** cells; Universal memory; Application; Microprocessor chips; Electron tunneling; Electric loads; Electric resistance; Electric potential; Metallizing; Logic design; Extrapolation; Random access storage; Theory

Controlled Term (in French)

Application; Puce microprocesseur; Effet tunnel electronique; Charge reseau electrique; Resistance electrique; Potentiel electrique; Metallisation; Conception logique; Extrapolation; Memoire acces direct; Theorie

Controlled Term in German

Anwendung

Controlled Term (in Spanish)

Aplicacion

Session Cost: \$11.71



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- #4 (mram<in>metadata) <and> (magnetic tunnel junction<in>metadata)
- #5 (mram<in>metadata) <and> (magnetic tunnel junction<in>metadata)
- #6 (mram<in>metadata) <and> (magnetic tunnel junction<in>metadata) <and> (reference<in>metadata)
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